Docket No.: HI-0207 PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCE

In re Application of	Confirmation No.: 5506
Gang Hoon LEE and Jai Hyun JO	Group Art Unit: 3677
Serial No.: 10/502,088	Examiner: Mark T. Vogelbacker
Filed: July 22, 2004	Customer No.: 34610

For: HINGE STRUCTURE FOR FLAT VISUAL DISPLAY DEVICE

APPEAL BRIEF

U.S. Patent and Trademark Office
Customer Window, Mail Stop Appeal Brief-Patents
Randolph Building
401 Dulany Street
Alexandria, Virginia 223134

Sir:

This appeal is taken from the rejection of claims as set forth in the Office Action of January 24, 2006 (hereinafter the Office Action). In accordance with 37 C.F.R. §41.37, applicant addresses the following items.

REAL PARTY IN INTEREST

The real party in interest is the assignee, LG Electronics Inc. The assignment document is recorded at Reel 016328 and Frame 0307.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

STATUS OF THE CLAIMS

This is an appeal from the final rejection dated January 24, 2006 of claims 2, 4, 7, 9, 14-23, 25 and 26.

Claims 2, 4, 7-9, 12-14, 18-24 and 26-32 are pending in the application. Claims 1, 3, 5, 6, 10, 11, 15-17 and 25 have been canceled. Claims 12, 13 and 27-32 are pending, but have been withdrawn from consideration. The claims which are under consideration and rejected are claims 2, 4, 7, 9, 14, 18-23 and 26. Claims 8 and 24 are objected to as depending from a rejected independent claim.

STATUS OF AMENDMENTS

All Amendments filed in this application have been entered. A copy of appealed claims 2, 4, 7-9, 14, 18-24 and 26, appears in the attached Claims Appendix.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The following summary of the invention explains the features of independent claims 14 and 20, and various dependent claims that are involved in this appeal with references to one embodiment of the invention that is shown in the Figures and described in the specification. The summary makes specific references to the specification and drawings. Although the following summary refers to one embodiment of the invention, is not intended to be a

discussion of the full and entire scope of the claims. Other interpretations, configurations and embodiments are also within the scope of the pending claims.

Independent claim 14 is directed to a hinge structure for a flat visual display device. An example of a hinge structure as recited in claim 14 is shown in Figs. 1-9 of the application. References will be made to the reference numbers of the elements shown in Figs. 1-9 in the following description.

The hinge structure includes a fixed plate 20 and two pivotal plates 10. A rotation shaft 30 passes through holes in vertical planar portions of the fixed plate 20 and extends out on either side of the fixed plate 20. Flat portions 31 of the rotation shaft 30 are inserted into slots 11 in the pivotal plates 10. As a result, the pivotal plates 10 will rotate with the rotation shaft 30. See the specification at page 4, lines 1-18, and at page 8, lines 1-8.

As shown in Figures 2 and 3, a braking member 81 is mounted around the exterior cylindrical portion of the rotation shaft 30. The braking member is surrounded by a braking housing 84, and the combination of the braking member 81 and the braking housing 84 are mounted on the fixed plate 20 by a braking adjustable member 89. Braking-tightening planes 83 extend from the frictional face 82 of the braking member 81. A leaf spring 87 is inserted between contact faces of the braking-tightening planes 83 of the braking member 81. See the specification at page 4, lines 19-30.

The braking adjustable member 89 can be tightened or loosened to increase or decrease the amount of frictional force that the braking member 81 applies to the rotational shaft 30. The leaf spring 87 located between the contact faces of the braking-tightening planes allow the braking force to be adjusted in minute amounts. See the specification at page 6, lines 16-22.

As shown in Figure 4, an elastic member 60 has one end coupled to one of the pivotal plates, and a second end coupled to the fixed plate 20. The elastic member 60 is configured to generate a restoring force to offset the weight of a flat visual display device which is attached to the fixed plate 20. This allows the user to adjust the position of a flat visual display device attached to fixed plate 20 with a slight amount of force. See the specification at page 5, lines 19-31.

Claim 20 is also directed to a hinge structure for a display device. Claim 20 recites a fixed plate 20 having a main body portion configured to be mounted on a support, and first and second arms 22 that extend from the main body portion. A rotation shaft 30 passes through the first and second arms 22 of the fixed plate 20. First and second pivotal plates 10 are configured to be attached to a display device. The first and second pivotal plates 10 are fixed to first and second ends of the rotation shaft 30 such that the pivotal plates 10 rotate with the rotation shaft 30 relative to the fixed plate 20. This is accomplished by having the flat end portions 31 of the rotation shaft 30 inserted into slots in the pivotal plates 10. See the specification at page 4, lines 1-18, and at page 8, lines 1-8.

The device further includes a braking unit which is mounted on the fixed plate 20. The braking unit is configured to apply a frictional force to the rotation shaft to limit rotation of the rotation shaft 30 relative to the fixed plate 20. The braking unit includes a braking member 81 that includes two tightening plates 83 which are joined by a substantially cylindrical friction portion 82 which surrounds an outer circumference of the rotation shaft 30. The braking member is configured to apply friction to the rotation shaft 30 to limit movement of the rotation shaft. See the specification at page 4, lines 19-30.

A leaf spring 87 is interposed between the tightening plates 83 of the braking member 81. A fastener 89 is configured to adjust a spacing between the tightening plates 83 to thereby vary amount of friction applied to the rotation shaft 30 by the braking member 81. See the specification at page 4, lines 19-30 and at page 6, lines 16-22.

As shown in Fig. 6 of the application, at least one of the first and second arms 22 of the fixed plate 20 may include a protrusion 23. In addition, a stopper guide 50 may be mounted on the rotation shaft 30. A slot in the stopper guide would surround the flattened portion 31 of the rotation shaft 30 to ensure that the stopper guide 50 rotates with the rotation shaft 30. A guide groove 51 in the stopper guide 50 would interact with the protrusion 23 on the fixed plate 20 such that the rotations shaft 30 can only rotate a predetermined amount relative to the fixed plate 20. In addition, a sliding member 70 may be mounted between the fixed plate 20 and the stopper guide 50 to restrict noise and abrasion. See the specification at page 9, lines 14-28.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The Examiner originally set forth the following rejections in the Office Action dated January 24, 2006:

1. Claims 2, 4, 9, 14, 18-23 and 26 were rejected under 35 U.S.C. §103(a) over Cho (U.S. Patent Publication No. 2001/0052167), in view of Rude (U.S. Patent No. 5,406,678).

2. Claims 7, 15-17, 25 and 26 were rejected under 35 U.S.C. §103(a) over Cho, in view of Rude, and further in view of Watabe (U.S. Patent No. 5,682,645).

The Amendment After Final Rejection filed March 28, 2006 amended independent claim 14 to include features of claims 15-17, and amended independent claim 20 to include features of

claim 25. The features added to independent claims 14 and 20 were features that the Examiner originally asserted were shown or taught by Watabe. Although the Advisory Action continued to assert that independent claims 14 and 20 were obvious over only the Cho and Rude references, Applicant presumes that this was a mistake. Instead, Applicant presumes, for purposes of this Appeal, that the Examiner intended to reject all of claims 2, 4, 7, 9, 14, 18-23 and 26 under 35 U.S.C. §103(a) over Cho, in view of Rude, and further in view of Watabe. **Thus, for purposes of this Appeal, the grounds of rejection to be reviewed on appeal are whether claims 2, 4, 7, 9, 14, 18-23 and 26 are unpatentable under 35 U.S.C. §103(a) over Cho, in view of Rude, and further in view of Watabe.**

ARGUMENT

I. Claims 14, 18 and 19

Cho, in Fig. 1, discloses a fixed bracket 1, rotating brackets 2, and a shaft 3 coupled both to the fixed bracket 1 and the rotating brackets 2. As disclosed in Fig. 1 of Cho, the shaft 3 is coupled to opposing sides of the fixed bracket 1. A rotating angle limiting washer 5 is positioned between the shaft 3 and the pivotal plate 2. Various oil washers 6, a separating tension washer 7, and a fixing ring 8 are then mounted to a round bar portion on an end of the shaft 3.

To hold Cho's hinge assembly together and apply proper torque, friction, or force to the shaft 3, the end of the round bar of the shaft 3 is deformed by impact so that the deformed portion of the bar pushes all of the various washers 6-8 laterally (see, for example, Fig. 2, page 1, paragraph [0009] of Cho). Cho further discloses that the deformation of the shaft end caused by

impact does not enable resetting of the hinge assembly once assembled, or fine tuning the amount of lateral force applied to the washers 6-8 on the round bar so that a proper torque is applied to the shaft 3. As acknowledged by the Examiner, Cho also lacks a braking member as recited in claim 14.

Rude discloses a friction hinge assembly having a band 21 with a circular portion 25 that wraps around a shaft 17 (see, for example, Figs. 3 and 4 of Rude). Similar circular portions that wrap around the shaft are also shown in Figs. 6, 7, 9, 10 and 11 of Rude. In the various views of Rude, the band 21 may be formed separate from the bracket 19 as shown in Fig. 3, or the band may be an integral part of the bracket 47 as shown in Fig. 11. Rude discloses that the wrap around band 25 applies a different amount of restraining torque to the shaft depending on the direction of the wrap 25 of the band 21 and the direction that the shaft is rotating. The highest torque is applied when the shaft is rotated in the same direction that the band tightens. A torque resistance of roughly one-half to three quarters occurs when the shaft rotates in the opposite direction (see, for example, col. 1, lines 29-40 of Rude).

Watabe discloses a control assembly for a hinge connection. In this assembly, a braking member 6 is surrounded by a holding member 5 made of steel. The braking member 6 and holding member 5 wrap around a pivot shaft 3 which remains stationary (see Fig. 3 of Watabe). The braking member 6 includes braking-tightening planes 14/15 which extend from the frictional face of the braking member 6. A screw 7 passes though the braking-tightening planes 14/15, and the screw can be tightened or loosened to adjust the braking force applied by the braking member 6. As shown in the various Figures in Watabe, there is nothing located between the braking-tightening planes 14/15 of the braking member 6.

Claim 14 is directed to a hinge structure that includes a braking member having a frictional face contacting with a rotation shaft and braking-tightening planes that extend from the frictional face. Claim 14 recites that the braking tightening planes have contact faces into which a leaf spring and a braking-adjustable member are inserted for adjusting braking force. Claim 14 further recites a braking housing around the braking member for maintaining a strength of the braking member.

As noted above, Cho lacks any structure that would correspond to the claimed braking member, braking housing or leaf spring. Cho also lacks any structure that would correspond to the claimed braking-adjustable member for adjusting braking force. As noted above, once the Cho hinge is assembled, the braking force cannot be adjusted.

If one were to consider the band 21 of the Rude friction hinge to correspond to the claimed braking member, the Rude band 21 clearly lacks braking-tightening planes that extend from the frictional face. Rude also lacks the recited leaf spring and braking-adjustable member for adjusting braking force. Again, as noted above, the frictional force provided by the Rude structure cannot be adjusted. The Rude structure also lacks a separate braking housing around the braking member for maintaining a strength of the braking member.

The Watabe structure includes a braking member 6 with braking-tightening planes 14/15 that extend from the frictional face. However, the Watabe structure lacks the claimed leaf spring located between the contact faces of the braking-tightening planes 14/15.

The Final Rejection asserts that the braking-tightening planes 14/15 themselves comprise the claimed leaf spring. However, it is respectfully submitted that claim 14 cannot be construed in such a way that it reads on the Watabe structure. Claim 14 recites that the leaf spring is

inserted into the contact faces of the braking-tightening planes. It makes no sense to say that the braking-tightening planes are themselves a leaf spring located between contact faces of themselves. The Watabe structure, like the Cho and Rude structures, simply lacks a leaf spring inserted between the braking-tightening planes of a braking member, as recited in claim 14.

Because none of the cited references include all the features recited in claim 14, and in particular, none of the cited references disclose or suggest the claimed leaf spring, it is respectfully submitted that claim 14 is allowable. Claims 18 and 19 depend from claim 14 and are allowable for at least the same reasons.

II. Claims 2, 4, 7, 9, 20-23 and 26

A. Claims 2, 7, 9, 20, 22

Claim 20 is also directed to a hinge structure that includes a braking unit. Claim 20 recites that the braking unit includes a braking member that includes a two tightening plates joined by a substantially cylindrical friction portion which surrounds an outer circumference of a rotation shaft and which is configured to apply friction to the rotation shaft to limit movement of the rotation shaft. Claim 20 further recites that the braking unit includes a leaf spring that is interposed between the tightening plates. Claim 20 also recites a fastener configured to adjust a spacing between the tightening plates, to thereby vary an amount of friction applied to the rotation shaft by the braking member.

As noted above, Cho and Rude fail to disclose even a braking member with two tightening plates joined by a substantially cylindrical friction portion. Although Cho arguably discloses a braking member, Cho fails to disclose or suggest that a leaf spring is interposed

between the tightening plates. Because none of the cited references disclose or suggest providing a leaf spring between the tightening plates of a braking member, it is respectfully submitted that claim 20 is allowable. Claims 2, 4, 7, 9 and 22 depend from claim 20 and are allowable for at least the same reasons.

B. Claim 21

Claim 21 depends from claim 20 and further recites that first and second ends of a rotation shaft of the device have flat portions which are configured to be inserted into slots in the respective pivotal plates so that the pivotal plates rotate with the rotation shaft. One embodiment of such a structure is shown in Figure 4 of the application. As shown therein, flat portions 31 of the shaft 30 are inserted into slots 11 in the pivotal plates 12 such that the pivotal plates rotate with the shaft.

The Rude and Watabe references fail to disclose that the rotation shafts have any flat portions, let alone pitotal plates with slots configured to receive such flat portions. In the Cho device, the pivotal plates 2 have round holes that receive round portions of the shaft 3 such that the pivotal plates may rotate with respect to the shaft 3. Thus, Cho also fails to disclose or suggest the above discussed features of claim 21. For the reasons discussed above in connection with claim 20, and for these additional reasons, it is respectfully submitted that claim 21 is allowable.

C. Claim 23

Claim 23 recites that at least one of first and second arms of a fixed plate of the device includes a protrusion. Claim 23 further recites that a pivoting restriction unit of the device comprises at least one stopper guide which is mounted on the rotation shaft so that the stopper guide rotates with the rotation shaft, and wherein the stopper guide includes a guide groove which receives the protrusion such that the stopper guide and the attached rotation shaft can only rotate a predetermined amount relative to the fixed plate. An embodiment of such a device is shown in Figure 6 of the application. As shown therein, a stopper guide 50 is mounted on a flat portion 31 of the rotation shaft 30 such that the stopper guide 50 rotates with the rotation shaft 30. The stopper guide 50 includes a guide groove 51 which receives a protrusion 23 on the fixed plate 20. The interaction between the protrusion 23 and the guide groove 51 ensures that the rotation shaft can only rotate a predetermined amount relative to the fixed plate.

The Rude and Watable references fail to disclose any structure corresponding to the pivoting restriction unit recited in claim 23. In the Cho reference, although a rotation angle limiting washer 5 is mounted on the shaft 3, the guide groove in the washer 5 does not interact with any protrusion on the fixed plate 1. Instead, a protrusion on the pivotal plate 2 is inserted into the guide groove on the washer 5. In addition, interaction between the rotation limiting washer 5 and protrusion on the pivotal plate 2 does not act to ensure that the rotation shaft can only rotate a predetermined amount relative to the fixed plate. In fact, in the Cho reference, the rotation shaft 3 is never intended to rotation relative to the fixed plate 1. For the reasons discussed above in connection with claim 20, and for these additional reasons, it is respectfully submitted that claim 23 is allowable.

D. Claim 4

Claim 4 depends from claim 23 and further recites a sliding member provided between the fixed plate and the at least one stopper guide for restricting noise and abrasion. The Cho, Rude and Watabe references all lack any type of sliding member provided between the fixed plate and a stopper guide, as recited in claim 4. In fact, the Rude and Watabe references fail to even disclose or suggest any type of stopper guide. For the reasons discussed above in connection with claims 20 and 23, and for these additional reasons, it is respectfully submitted that claim 4 is allowable.

E. Claim 26

Claim 26 depends from claim 20 and further recites that the leaf spring allows the spacing between the tightening planes to be adjusted in minute amounts. As noted above, the Cho, Rude and Watabe references all lack the claimed leaf spring. Thus, the cited references also fail to disclose or suggest that the leaf spring allows the spacing between the tightening plates to be adjusted by minute amounts. Thus, for all the reasons discussed above in connection with claim 20, and for these additional reasons, it is respectfully submitted that claim 26 is allowable.

CONCLUSION

It is respectfully submitted that the above arguments show that each of claims 2, 4, 7-9, 14, 18-24 and 26 are patentable over the applied references. Applicant respectfully requests that the rejections of claims 2, 4, 7-9, 14, 18-24 and 26 set forth in the January 24, 2006 Office Action be withdrawn.

Respectfully submitted,
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CLAIMS APPENDIX

1. (Canceled).

2. (Previously Presented) The hinge structure according to claim 20, further comprising at least one anti-release member respectively provided on each of the first and second ends of the rotation shaft for preventing release of the pivotal plates from the rotation shaft.

3. (Canceled).

4. (Previously Presented) The hinge structure according to claim 23, further comprising at least one sliding member provided between the fixed plate and the at least one stopper guide for restricting noise and abrasion.

5-6. (Canceled).

7. (Previously Presented) The hinge structure according to claim 20, further comprising a braking housing for surrounding an outer circumference of the braking member for restricting fracture of the braking member.

8. (Previously Presented) The hinge structure according to claim 20, wherein the

leaf spring has a plurality of planes defined by folds.

9. (Previously Presented) The hinge structure according to claim 20, wherein said braking member is made of engineering plastic.

10-11. (Canceled).

12. (Previously Presented) The hinge structure according to claim 31, further comprising at least one spacing member fitted around the rotation shaft, and positioned between the rotation shaft and the at least one elastic member for preventing noise and abrasion of the rotation shaft against the at least one elastic member.

13. (Previously Presented) The hinge structure according to claim 30, wherein said braking unit comprises a braking member made of engineering plastic.

14. (Previously Presented) A hinge structure for a flat visual display device comprising:

a braking member made of engineering plastic and provided on an outer circumference of a rotation shaft which is inserted into fixed and pivotal plates wherein said braking member comprises:

a frictional face contacting with said rotation shaft for providing braking force, and

braking-tightening planes extended from said frictional face and having contact faces into which a leaf spring and a braking-adjustable member are inserted for adjusting braking force;

a braking housing around said braking member for maintaining the strength of said braking member; and

at least one elastic member having a first end coupled to one of said pivotal plates and a second end coupled to said fixed plate, wherein said at least one elastic member is configured to generate a restoring force to offset the weight of the flat visual display device so as to adjust the flat visual display device with a slight amount of force, whereby the weight of the flat visual display device is supported and the movement thereof is compensated.

15-17. (Canceled).

18. (Original) The hinge structure according to claim 14, wherein said braking member is provided in said fixed plate.

19. (Original) The hinge structure according to claim 14, further comprising a non-circular rotation shaft-fixing end in at least one portion of said rotation shaft for rotating said pivotal plates or said fixed plate together with said rotation shaft.

20. (Previously Presented) A hinge structure for a display device, comprising:

a fixed plate having a main body portion configured to be mounted on a support

and first and second arms that extend from the main body portion;

a rotation shaft that passes through the first and second arms of the fixed plate;

first and second pivotal plates configured to be attached to a display, wherein the first and second pivotal plates are fixed to first and second ends of the rotation shaft such that the pivotal plates rotate with the rotation shaft relative to the fixed plate; and

a braking unit which is mounted on the fixed plate, wherein the braking unit is configured to apply a frictional force to the rotation shaft to limit rotation of the rotation shaft relative to the fixed plate, and wherein the braking unit comprises:

a braking member that includes two tightening plates joined by a substantially cylindrical friction portion which surrounds an outer circumference of the rotation shaft and which is configured to apply friction to the rotation shaft to limit movement of the rotation shaft;

a leaf spring interposed between the tightening plates; and

a fastener configured to adjust a spacing between the tightening plates, to thereby vary an amount of friction applied to the rotation shaft by the braking member.

21. (Previously Presented) The hinge structure according to claim 20, wherein the first and second ends of the rotation shaft have flat portions which are configured to be inserted into slots in the respective pivotal plates so that the pivotal plates rotate with the rotation shaft.

22. (Previously Presented) The hinge structure according to claim 20, further comprising a pivoting restriction unit configured to limit pivotal movement of the pivotal plates

relative to the fixed plate.

23. (Previously Presented) The hinge structure according to claim 22, wherein at least one of the first and second arms of the fixed plate includes a protrusion, wherein the pivoting restriction unit comprises at least one stopper guide which is mounted on the rotation shaft so that the stopper guide rotates with the rotation shaft, and wherein the stopper guide includes a guide groove which receives the protrusion such that the stopper guide and the attached rotation shaft can only rotate a predetermined amount relative to the fixed plate.

24. (Previously Presented) The hinge structure according to claim 4, wherein the sliding member comprises a washer mounted on the rotation shaft between the at least one stopper guide and the fixed plate, wherein the sliding member includes a sliding portion that abuts the at least one stopper member and a hole sliding portion that is inserted into a corresponding recess on the fixed plate.

25. (Canceled).

26. (Previously Presented) The hinge structure according to claim 20, wherein the leaf spring allows the spacing between the tightening plates to be adjusted in minute amounts.

27. (Previously Presented) A hinge structure for a display device, comprising:

a fixed plate having a main body portion and first and second arms that extend

from the main body portion;

a rotation shaft that passes through the first and second arms of the fixed plate;

first and second pivotal plates configured to be attached to a display, wherein the first and second pivotal plates are fixed to first and second ends of the rotation shaft such that the pivotal plates rotate with the rotation shaft relative to the fixed plate; and

a hinge-fixing unit having first and second rotation shaft guides which receive the first and second ends of the rotation shaft, wherein the hinge-fixing unit is configured to restrict shaking of the rotation shaft, and wherein the fixed plate is attached to and supported by the hinge-fixing unit.

28. (Previously Presented) The hinge structure according to claim 27, further comprising a pivoting restriction unit configured to limit rotation of the rotation shaft relative to the fixed plate.

29. (Previously Presented) The hinge structure according to claim 27, further comprising a braking unit which is mounted on the fixed plate and which surrounds the rotation shaft, wherein the braking unit is configured to apply a frictional force to the rotation shaft.

30. (Previously Presented) The hinge structure according to claim 29, wherein the braking unit comprises:

a braking member that includes two tightening plates joined by a substantially cylindrical friction portion which surrounds an outer circumference of the rotation shaft and

which is configured to apply friction to the rotation shaft to limit movement of the rotation shaft;

a leaf spring interposed between the tightening plates; and

a fastener configured to adjust a spacing between the tightening plates, to thereby vary an amount of friction applied to the rotation shaft by the braking member.

31. (Previously Presented) The hinge structure according to claim 27, further comprising at least one elastic member mounted on the rotation shaft that is configured to apply an elastic force that tends to return the first and second pivotal plates to a predetermined rotational position relative to the fixed plate.

32. (Previously Presented) The hinge structure of claim 31, wherein the at least one elastic member comprises a spring having a first end coupled to the fixed plate and a second end coupled to one of the first and second pivotal plates.

EVIDENCE APPENDIX

Applicant has not provided any evidence with this appeal and therefore an Evidence Appendix is not provided.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings, and therefore a Related Proceeding Appendix is not provided.